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SUMMARY

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PROBLEMS RAISED BY THE CREATION OF STEEL INDUSTRIES IN DEVELOPING COUNTRIES

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Research Institute

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PROBLEMS RAISED BY THE CREATION OF STEEL INDUSTRIES IN DEVELOPING COUNTRIES

By
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Technical aid requirements vary from country to country. Some already have industries and training centres, in which case assistance will be sought by both government departments and private industry. In others, where the technical level is lower, requests for aid will virtually be confined to government level and the range of subjects covered will be much greater. It is the latter case with which we shall mainly deal in this paper.

The creation of local steel industries has two main objectives:

1. To manufacture steel products for local markets in order to guarantee the country concerned a certain amount of independence, to limit the drain on its currency and to stimulate the creation of other industries. Not only must manufacturing costs be kept low, but the maximum amount of local materials and labour must be used in order to eliminate dependence on imports.

2. Alternatively, to exploit and develop local ore-fields, possibly too poor to compete on the world market. The location of the plant depends on transport facilities for raw materials to the plant and for finished products from the plant to consumers. Coastal or river sites are most suitable. Manufacturing costs must be competitive and imports of materials kept to a minimum.

The most suitable type of plant will be the integrated one. This avoids the import of semi-manufactured products required by non-integrated plants, which will constitute no more than a temporary phase. Semi-integrated plants using local scrap may also be set up, but only in special cases.

Ways of providing technical aid.

A. Preliminary basic studies will include: a) Exploratory economic surveys relating to raw materials, energy sources and markets for steel products; b) A study of the capacity of the plant and the range of products to be manufactured. Capacity may vary from 12,000 to 2,000,000 tons per annum according to circumstances. Small plants may be useful in some countries and large plants may be very vulnerable to disturbances in world markets; c) A study of the technical aspects of the plant. All cases in developing countries are special ones and there is no specific solution suitable for these countries as such. Mechanisation and automation will help to reduce the need for training too many technicians for routine duties.

No list can be given of all the possible solutions. This will be a matter for decision by specialists on the basis of data supplied to them. In steelmaking (from the ore to the ingot), we know that the blast furnace and direct reduction electric furnace (if electricity is cheap) have made great strides and are still the most popular methods. The blast furnace is a very flexible plant. Other processes of the indirect reduction type should only be recommended after considerable thought, since they need very rich, well-dressed ore and entail the remelting of the reduced product. A blast furnace working on hydrocarbons or charcoal represents a

serious competitor to these indirect reduction methods. The adoption of continuous casting is an advantage in that it cuts the cost of rolling mill plant. In steel shaping (from the ingot to the finished product), new methods such as planetary hot rolling mills and extrusion processes should be considered.

B. As regards the construction of the steel mill and the assembly and starting-up of the plant, reliable and independent engineering consultants will be consulted and suppliers of equipment approached after detailed discussions.

C. Aid in the form of technical training must be extended to a wide range of levels: a) management personnel, advised directly by specialists and invited for study tours and practical courses; b) future senior technical staff, to be trained and educated in the advising countries and then in technical colleges to be set up in their own countries; c) supervisory and specialised personnel for whom the foregoing procedure will be used, but to a lesser degree; d) routine staff, some of whom will also have to be trained abroad.

Channels through which aid is available - the French example.

The preliminary basic studies (see Section A) will require polyvalent specialists whose knowledge is continually kept up to date, such as those to be found in France at the Bureau of Geological and Mining Research (BRGM) for ore problems, at the French Iron and Steel Research Institute (IRSID) for questions concerning steel manufacture and at the French Coal Study and Research Centre (CERCHAR) on coke and coal. These are pure research bodies without any commercial preoccupations.

In case of need they can be supplemented by various French firms of engineering and planning consultants such as SOFREMINES for mining, SOFRELEC for electricity and steel manufacture and SOFRESID and other firms purely on steel manufacture.

At the detailed planning stage, the firms of consultants listed above will draw up outline projects, and the building and assembly of the plant will be covered by the contractors selected, assisted by experts made available by the steel companies.

Aid in the form of technical training (visits, practical courses, missions, the establishment of training and information centres in developing countries) can take place through a number of channels, which are co-ordinated in France by the Association for the Organisation of Practical Courses in French Industry (ASTEF) and the Association for the Organisation of Industrial Missions of Technical Co-operation (ASMIC), representing both private industry and the government. The latter body also awards study grants. In its own country, labour for steel plants can be trained by audio-visual media. In addition, regular visits by professors and lecturers to developing countries is to be recommended.

The French steel industry, in conjunction with IRSID in particular and also with the Centre for Higher Steel Studies at Metz (CESSID), plus the engineering and planning consultants and steel plant contractors, can provide a comprehensive and effective range of assistance covering all aspects of the steel industry.

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